REMARKS

This Response is responsive to the final Office Action mailed February 12, 2008. Claim 1, 3, 5-8, 15-19, 34, 35, 43, 44, 46-48, 52, and 53 are pending. Claims 9-13, 20, 36-42, and 49-51 are withdrawn. Claims 1 and 43 have been amended. In view of the following remarks, as well as the preceding amendments, Applicants respectfully submit that this application is in complete condition for allowance and request reconsideration of the application in this regard.

Rejection Under 35 U.S.C. § 112, 2nd Paragraph

Claims 1, 3, 5-8, 15-19, 34, 35, 43, 44, 46-48, 52, and 53 stand rejected under 35 U.S.C. § 112, 2nd Paragraph. Applicant has amended claims 1 and 43 in a manner sufficient for the Examiner to withdraw the rejection.

Rejections Under 35 U.S.C. § 103

Claims 1, 3, 5-8, 15-19, 34, 35, 43, 44, 46-48, 52, and 53 over Choi and Occhipinti

Claims 1, 3, 5-8, 15-19, 34, 35, 43, 44, 46-48, 52, and 53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Choi et al. (U.S. Patent No. 6,566,704), hereinafter *Choi*, in view of U.S. Publication No. 2004/0027889 to Occhipinti et al. (hereinafter *Occhipinti*). Claims 1 and 43 are independent claims. Applicants respectfully traverse the rejection for the reasons set forth below.

Claim 1 sets forth "an interconnected plurality of semiconductor device structures arranged in an array characterized by a plurality of rows and a plurality of columns" and that each of said semiconductor device structures includes "a plurality of semiconducting carbon nanotubes extending substantially vertically between opposite respective first and second ends adjacent to said vertical sidewall of said gate electrode." The Examiner admits that Figure 3F of *Choi* fails to disclose a plurality of nanotubes and that the device structures are arranged as an interconnected plurality of semiconductor device structures in an array. However, the Examiner attempts to rely on Figure 4B of *Choi* to cure these deficiencies.

Figure 4B of *Choi* discloses a device construction containing multiple nanotubes (100). However, Figures 4A and 4B of *Choi* teach that, when multiple nanotubes (100) are present in the device construction, the gate electrode (20) and gate dielectric (30) are both disposed above

the nanotubes (100) in an overlying relationship. Figures 4A and 4B of *Choi* also teach that, when multiple nanotubes (100) are present in the device construction, the gate dielectric (30) is disposed on a bottom surface of the gate electrode (20), instead of on a sidewall as that term is understood by a person having ordinary skill in the art. Moreover, Figures 4A and 4B of *Choi* also teach that, when multiple nanotubes (100) are present in the device construction, the gate electrode (20) and gate dielectric (30) are separated from one end of the nanotubes (100) by the drain (50). As a result, each of the nanotubes (100) in Figures 4A and 4B of *Choi* do not extend "substantially vertically between opposite first and second ends at respective locations adjacent to said vertical sidewall" of gate electrode (20) and the gate dielectric (30) between the gate electrode (20) and the nanotubes (100) is not disposed on a sidewall of gate electrode (20), as required by Applicants' claim 1.

Consequently, *Choi* teaches that, were one to attempt to modify the device structure shown in Figure 3F to include multiple nanotubes (100) as shown in Figures 4A and 4B, the gate electrode (20) must be moved so that the multiple nanotubes (100) are no longer positioned adjacent to a vertical sidewall of the gate electrode (20). In addition, this attempted modification would require that the gate dielectric (30) be moved so that it is no longer on a sidewall of the gate electrode (20). Furthermore, this attempted modification would require that the gate electrode (20), gate dielectric (30), and drain (50) be rearranged as shown in Figures 4A and 4B such that the gate electrode (20) and gate dielectric (30) are above the drain (50), instead of below the drain (50) as shown in Figure 3F.

Furthermore, according to MPEP § 2143, the prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success. In this instance, a person having ordinary skill in the art would not appreciate from the disclosure of multiple nanotubes associated with Figures 4A and 4B of *Choi* that a reasonable expectation of success exists to modify the structure shown in Figure 3F *Choi* as proposed by the Examiner if this modification requires that the gate electrode (20) be relocated to a different location in the device structure. As mentioned above, the specification of *Choi* itself recognizes that this modification proposed by the Examiner requires a wholesale rearrangement of the elements, including relocation of the gate electrode (20), gate dielectric (30), and drain (50), of the device structure of Figure 3F. *See* column 4, line 34 to column 5, line 7. Hence, these are not obvious

modifications that a person having ordinary skill in the art would have made to the device structure of Figure 3F with a reasonable expectation of success.

Choi expressly requires a different embodiment with a different arrangement of the gate electrode (20), gate dielectric (30), and drain (50), if multiple nanotubes (100) are present, as in Figures 4A and 4B, than if only a single nanotube (100) is present, as in Figure 3F. A *prima facie* case of obviousness may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. This requirement for a different embodiment is materially teaching away from modifying the device structure in Figure 3F as proposed by the Examiner.

Occhipinti fails to remedy these deficiencies in *Choi*.

For at least these reasons, Applicants submit that the Examiner has failed to properly support a case of *prima facie* obviousness with regard to claim 1. Therefore, Applicants respectfully request that the Examiner withdraw this rejection.

Because claims 3, 5-8, 15-19, 34, and 35 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons discussed in Applicants' preceding remarks. Furthermore, each of these claims recites a unique combination of elements not disclosed or suggested by the combination of *Occhipinti* with *Choi*.

Applicants' independent claim 43 is patentable for at least the same or similar reasons as independent claim 1. For at least this reason, Applicants respectfully request that the Examiner withdraw the rejection.

Because claims 44, 46-48, 52, and 53 depend from independent claim 43, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, each of these dependent claims recites a unique combination of elements not disclosed or suggested by the combination of *Choi* and *Occhipinti*.

In the "Response to Arguments" on page 9 of the Office Action, the Examiner states that:

> "The examiner does not suggest to rearrange the elements of the embodiment o *(sic)* figure 3F according to the embodiment of figure 4B of *Choi*. The embodiment of figure 4B is cited to merely teach an artisan that each of said semiconductor device structures is arranged as an interconnected plurality of semiconductor device structures in an array characterized by a plurality of rows and columns."

With all due respect, the Examiner's statement is wholly conclusory and disregards that a person having ordinary skill in the art would not have had an objective reason to modify the device structure in Figure 3F of *Choi* per Figure 4B of *Choi*.

As explained in MPEP § 2143.02, "a rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art." In this instance and for reasons explained in great detail hereinabove, the respective functions of the elements in Figure 3F of *Choi* are changed by the Examiner's proposed modification and the results are not predictable. The prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success. In this instance, there is no reasonable expectation of success, for reasons explained in great detail hereinabove, that the device structure in Figure 3F could be modified as suggested by the Examiner.

The disclosure in Figure 4B of *Choi* and the disclosure in the secondary reference, *Occhipinti*, fail to teach or suggest the Examiner's proposed modification to the structure shown in Figure 3F of *Choi*. The alleged teaching from Figure 4B of *Choi* fails to address the structural modifications that a person having ordinary skill in the art would have made to the device structure of Figure 3F of *Choi* in order to arrange a plurality of the devices structures depicted in Figure 3F as a plurality of interconnected device structures and to successfully make this arrangement while replacing the single nanotube in the device shown in Figure 3F of *Choi* with multiple nanotubes. The Examiner's statement reproduced above also ignores the Examiner's reliance upon Figure 4B of *Choi* as also teaching a plurality of nanotubes in the device structure, which is absent from Figure 3B of *Choi*. Given the disclosure in Figure 4B of *Choi*, a person having ordinary skill in the art would not have appreciated how to modify the structure shown in Figure 3F of *Choi* to include a specific arrangement of multiple devices and that each of these multiple devices could include multiple nanotubes. Even *Choi* sets forth the single nanotube device structure and the multiple nanotube device structure in separate and distinct embodiments in its written description, which a person having ordinary skill in the art would have interpreted

to mean that the intrinsic evidence in *Choi* itself fails to demonstrate that there would have been a reasonable expectation of success to make the modifications suggested by the Examiner.

Claims 5, 6, 34, and 46 over Choi, Occhipinti, and Farnworth

Claims 5, 6, 34, 37, and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable *Choi* and *Occhipinti* further in view of Farnworth et al. (U.S. Patent No. 6,515,325), hereinafter *Farnworth*. Because claims 5, 6, and 34 depend from independent claim 1 and claim 46 depends from independent claim 43, Applicants submit that these dependent claims are patentable for at least the same reasons. Furthermore, these dependent claims recite unique combinations of elements not taught, disclosed or suggested by the combination of *Choi*, *Occhipinti*, and *Farnworth*.

Conclusion

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing remarks and amendments, this application is submitted to be in complete condition for allowance. Accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe any fees are due in connection with filing this communication. If, however, any fees are necessary as a result of this communication, the Commissioner is hereby authorized to charge any under-payment or fees associated with this communication or credit any over-payment to Deposit Account No. 23-3000.

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Date

Respectfully submitted,
/William R. Allen/
William R. Allen, Ph.D.
Reg. No. 48,389

WOOD, HERRON & EVANS, L.L.P.
2700 Carew Tower
441 Vine Street
Cincinnati, Ohio 45202
Telephone: (513) 241-2324
Facsimile: (513) 241-6234